



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/803,689	03/18/2004	Bradley I. Todd	HES 2003-IP-010245U1	6170
29920	7590	05/31/2007	EXAMINER	
JOHN W. WUSTENBERG			COY, NICOLE A	
P.O. BOX 1431			ART UNIT	PAPER NUMBER
DUNCAN, OK 73536			3672	
			MAIL DATE	DELIVERY MODE
			05/31/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/803,689	TODD ET AL.	
	Examiner	Art Unit	
	Nicole Coy	3672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-34,38,41-69 and 71-94 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☒ Claim(s) 12,65-69 and 82 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 3-6, 11, 18-20, 22, 32-34, 38, 41, 42, and 45-50 are rejected under 35 U.S.C. 102(e) as being anticipated by Cooke, JR. (US 2004/0231845).

With respect to claims 1 and 38, Cooke, JR. discloses a disposable downhole tool or a component thereof comprising an effective amount of biodegradable material such that the tool or the component desirably decomposes when exposed to a wellbore environment; wherein the tool comprises a frac plug, a bridge plug, or a packer, and wherein the biodegradable material comprises a degradable polymer (see paragraph [0033]).

With respect to claim 3, Cooke, JR. discloses that the degradable polymer comprises an aliphatic polyester (see paragraph [0034]).

With respect to claim 4, Cooke, JR. discloses that the aliphatic polyester comprises a polylactide (see paragraph [0034]).

With respect to claim 5, Cooke, JR. discloses that the polylactide comprises poly(L-lactide), poly(D-lactide), poly(D,L-lactide), or combinations thereof (see paragraph [0034]).

With respect to claim 6, Cooke, JR. discloses that the biodegradable material comprises one or more compounds selected from the group consisting of polysaccharides; chitin; chitosans; proteins; aliphatic polyesters; poly(lactides); poly(glycolides); poly(epsilon-caprolactones); poly(hydroxybutyrates); poly(anhydrides); aliphatic polycarbonates; poly(orthoesters); poly(amino acids); poly(ethylene oxides); and polyphosphazenes (see paragraph [0034]).

With respect to claim 11, Cooke, JR. discloses that the biodegradable material comprises poly(lactic acid) (see paragraph [0034]).

With respect to claim 18 and 41, Cooke, JR. discloses that the biodegradable material is selected to achieve a desired decomposition rate when the tool is exposed to the wellbore environment (see paragraph [0033]).

With respect to claims 19 and 42, Cooke, JR. discloses that the wellbore environment comprises an aqueous fluid (see paragraph [0023]).

With respect to claim 20, Cooke, JR. discloses that the tool or the component is self-degradable (see paragraph [0033]).

With respect to claims 22 and 47, Cooke, JR. discloses that the decomposition is due to hydrolysis (see paragraph [0020]).

With respect to claims 32 and 48, Cooke, JR. discloses that the decomposition comprises loss of structural integrity of the tool or the component (see paragraph [0033]).

With respect to claims 33 and 49, Cooke, JR. discloses that the decomposition comprises loss of functional integrity of the tool or the component (see paragraph [0033]).

With respect to claims 34 and 50, Cooke, JR. discloses that the tool or the component decomposes within about a predetermined amount of time (see paragraph [0033]).

With respect to claims 45 and 46, the fluid can be applied to the tool before, during or after the downhole operation.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 7-10, 13-17, 23-31, 43, 51-64, 71-81, and 83-94 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cooke, Jr. in view of Bigg et al. (USP 6,323,307).

With respect to claim 7, Cooke, Jr. does not disclose polyanhydrides. Bigg et al. discloses that polyanhydrides can be added to a disposable material in order to improve

the degradation characteristics (see column 14 lines 30-48). It would have been obvious to one having ordinary skill in the art to modify Cooke, Jr. by using a polyanhydride as taught by Bigg et al. in order to improve the degradation characteristics.

With respect to claim 8, Cooke, Jr. does not disclose that the biodegradable material comprises one or more compounds selected from the group consisting of poly(adipic anhydride), poly(suberic anhydride), poly(sebacic anhydride), poly(dodecanedioic anhydride), poly(maleic anhydride), and poly(benzoic anhydride). Bigg et al. discloses adding poly maleic anhydride to a disposable material in order to improve the degradation characteristics (see column 14 lines 30-48). It would have been obvious to one having ordinary skill in the art to modify Cooke, Jr. by using poly maleic anhydride as taught by Bigg et al. in order to improve the degradation characteristics.

With respect to claim 9, Cooke, Jr. does not disclose plasticizers. Bigg et al. discloses adding plasticizers in order to modify and/or control the rate at which disposable materials degrade such that the disposal degradation rate is accelerated relative to the operative degradation rate (see column 14 lines 56-60). It would have been obvious to one having ordinary skill in the art at the time of the invention to modify Cooke, Jr. by including a plasticizer as taught by Bigg et al. in order to modify and/or control the rate at which disposable materials degrade.

With respect to claim 10, Cooke, Jr. in view of Bigg et al. teach that the plasticizers comprise derivatives of oligomeric lactic acid (see column 15 line 9-52).

With respect to claims 13 and 43, Cooke, Jr. does not disclose including a hydrated organic or inorganic solid compound. Bigg et al. discloses adding a hydrated organic or inorganic solid compound in order to provide an activator for the hydrolysis of the polymer (see column 11 lines 1-18). It would have been obvious to one having ordinary skill in the art at the time of the invention to modify Cooke, Jr. by including a hydrated organic or inorganic solid compound in order to provide an activator of the hydrolysis of the degradable polymer.

With respect to claim 14, Cooke, Jr. in view of Bigg et al. teaches that the hydrated organic or inorganic solid compound comprises hydrates of organic acids or organic acid salts (see column 11 lines 1-18).

With respect to claim 15, Cooke, Jr. in view of Bigg et al. discloses that the hydrated organic or inorganic solid compound comprises one or more compounds selected from the group consisting of: sodium acetate trihydrate, L-tartaric acid disodium salt dihydrate, sodium citrate dihydrate, sodium tetraborate decahydrate, sodium hydrogen phosphate heptahydrate, sodium phosphate dodecahydrate, amylose, starch-based hydrophilic polymers, and cellulose-based hydrophilic polymers (see column 11 lines 1-18).

With respect to claim 16, Cooke, Jr. does not disclose an aliphatic polyester and sodium acetate trihydrate. Bigg et al. discloses adding aliphatic polyester in order to activate the polymer (see column 11 lines 19-37) and sodium acetate trihydrate in order to attract and absorb substances that promote degradation (see column 11 line 49-column 12 line 31). It would have been obvious to one having ordinary skill in the art at

Art Unit: 3672

the time of the invention to modify Cooke, Jr. by adding aliphatic polyester in order to activate the polymer and sodium acetate trihydrate in order to attract and absorb substances that promote degradation.

With respect to claim 17, Cooke, Jr. in view of Bigg et al. disclose that the biodegradable material comprises a polyanhydride (see column 14 lines 30-48) and sodium acetate trihydrate (see column 12 lines 6-31).

With respect to claims 23 and 72, Cooke, JR. does not disclose an enclosure for storing a chemical solution that catalyzes decomposition. Bigg et al. discloses a capsule in order to control the rate of decomposition (see column 11 lines 19-37). It would have been obvious to one having ordinary skill in the art at the time of the invention to modify Cooke, Jr. by including a capsule as disclosed by Bigg et al. in order to control the rate of decomposition.

With respect to claims 24, 52, and 85, Cooke, Jr. in view of Bigg et al. discloses that the chemical solution comprises: a caustic fluid, an acidic fluid, an enzymatic fluid, an oxidizer fluid, a metal salt catalyst solution or a combination thereof (see column 11 lines 19-37).

With respect to claim 25, Cooke, Jr. in view of Bigg et al. discloses an activation mechanism for releasing the chemical solution from the enclosure (see column 11 lines 19-37).

With respect to claim 26, Cooke, Jr. in view of Bigg et al. discloses that the activation mechanism comprises a frangible enclosure body (see column 11 lines 19-37).

With respect to claims 27 and 76, Cooke, Jr. in view of Bigg et al. discloses that the activation mechanism is timer-controlled (see column 11 lines 26-27).

With respect to claims 28, 57, and 77, Cooke, Jr. in view of Bigg et al. disclose that the activation mechanism is mechanically operated (see column 11 lines 21-26).

With respect to claims 29, 58 and 78, Cooke, Jr. in view of Bigg et al. disclose that the activation mechanism is hydraulically operated (see column 11 lines 21-26).

With respect to claims 30, 59 and 79, Cooke, Jr. in view of Bigg et al. does not disclose electrical activation. However, it would have been considered obvious to one of ordinary skill in the art, at the time the invention was made, to have electrically activated, since the examiner takes Official Notice of the equivalence of electrical activation and mechanical, chemical and hydraulic activation for their use in the wellbore art and the selection of any of these known equivalents to activate the capsule would be within the level of ordinary skill in the art.

With respect to claims 31, 60, and 80, Cooke, Jr. in view of Bigg et al. does not disclose communication activation. However, it would have been considered obvious to one of ordinary skill in the art, at the time the invention was made, to have activated with communication means, since the examiner takes Official Notice of the equivalence of communication activation and mechanical, chemical and hydraulic activation for their use in the wellbore art and the selection of any of these known equivalents to activate the capsule would be within the level of ordinary skill in the art.

Art Unit: 3672

With respect to claims 51, 71, and 86, Cooke, Jr. in view of Bigg et al. discloses catalyzing decomposition of the tool or the component thereof by applying a chemical solution to the tool or the component thereof (see column 11 lines 1-48).

With respect to claim 53, Cooke, Jr. in view of Bigg et al. discloses that the chemical solution is applied to the tool or the component thereof before the downhole operation (see column 11 lines 19-21).

With respect to claim 54, Cooke in view of Bigg et al. discloses that the chemical solution is applied to the tool or the component thereof during the downhole operation (see column 11 lines 21-26).

With respect to claim 55, Cooke, Jr. in view of Bigg et al. discloses that the chemical solution is applied to the tool or the component thereof after the downhole operation (see column 11 lines 21-27).

With respect to claim 56, Cooke, Jr. in view of Bigg et al. discloses that the chemical solution is applied to the tool or the component thereof via a timer-controlled operation (see column 11 lines 26-27).

With respect to claim 61, Cooke, Jr. in view of Bigg et al. discloses that the chemical solution is applied to the tool or the component thereof by dispensing the chemical solution into the wellbore (see column 11 lines 19-27).

With respect to claim 62, Cooke, Jr. in view of Bigg et al. discloses that the dispensing step comprises injecting the chemical solution into the wellbore (see column 11 lines 19-27).

With respect to claim 63, Cooke, Jr. in view of Bigg et al. discloses that the dispensing step comprises: lowering a frangible object containing the chemical solution into the wellbore; and breaking the frangible object (see column 11 line 21-26).

With respect to claims 64, 83, and 84, Cooke, Jr. in view of Bigg et al. disclose that the dispensing step comprises: lowering a conduit into the wellbore (wherein there is a conduit in Cooke, Jr.); and flowing the chemical solution through the conduit onto the tool (wherein the capsule of Bigg et al. would have to flow through the conduit to get to the biodegradable tool).

With respect to claim 73, Cooke, Jr. in view of Bigg et al. disclose that the enclosure is disposed on the tool.

With respect to claim 74, Cooke, Jr. in view of Bigg et al. disclose an activation mechanism for releasing the chemical solution from the enclosure (see column 11 lines 21-27).

With respect to claim 75, Cooke, Jr. in view of Bigg et al. disclose that the activation mechanism is a frangible enclosure body (see column 11 lines 21-27).

With respect to claim 81, Cooke, Jr. in view of Bigg et al. disclose that the enclosure is broken to release the chemical solution (see column 11 lines 21-26).

With respect to claim 87, Cooke, Jr. in view of Bigg et al. disclose releasing the chemical solution from storage integral to the tool (wherein Bigg et al. teaches that the chemical solution can be coated on the disposable material; column 11 lines 19-21).

With respect to claim 88, Cooke, Jr. in view of Bigg et al. discloses that the applying step comprises releasing the chemical solution from storage external to the tool (see column 11 lines 21-26).

With respect to claim 89, Cooke, Jr. in view of Bigg et al. disclose that the applying step comprises dispensing the chemical solution into the wellbore.

With respect to claim 90, Cooke, Jr. in view of Bigg et al. disclose that the degradation comprises loss of structural integrity of the tool or the component thereof (see paragraph 33).

With respect to claim 91, Cooke, Jr. in view of Bigg et al. disclose that the degradation comprises loss of functional integrity of the tool or the component thereof (see paragraph 33).

With respect to claim 92, Cooke, Jr. in view of Bigg et al. disclose that the tool or the component thereof degrades within about a predetermined amount of time (see paragraph 33).

With respect to claim 93, Cooke, Jr. in view of Bigg et al. disclose that the applying step comprises a timer-controlled operation, a mechanical operation, a hydraulic operation, an electrical operation, an operation using a communication means, or a combination thereof (see column 11 lines 21-27).

With respect to claim 94, Cooke, Jr. in view of Bigg et al. disclose that the applying step comprises breaking a container that stores the chemical solution (see column 11 lines 21-27).

5. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cooke, Jr. in view of Erbatoesser et al (USP 4,716,964).

With respect to claim 21, Cooke, JR. is silent as to the temperature of the wellbore. Erbatoesser et al. discloses that degradable polymers degrade in wellbore temperatures of at least about 200 degrees Fahrenheit. It would have been obvious to one having ordinary skill in the art at the time of the invention to modify Cooke, JR. by using the degradable tool in temperatures of at least 200 degrees Fahrenheit as they would be suitable in these temperatures.

6. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cooke, Jr. in view of Bigg et al. in further view of Erbatoesser et al (USP 4,716,964).

With respect to claim 21, Cooke, JR. in view of Bigg et al. is silent as to the temperature of the wellbore. Erbatoesser et al. discloses that degradable polymers degrade in wellbore temperatures of at least about 200 degrees Fahrenheit. It would have been obvious to one having ordinary skill in the art at the time of the invention to modify Cooke, JR. in view of Bigg et al. by using the degradable tool in temperatures of at least 200 degrees Fahrenheit as they would be suitable in these temperatures.

Allowable Subject Matter

7. Claims 12, 65-69, 82 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Terminal Disclaimer

8. The terminal disclaimer filed on 4/10/07 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of 7,093,664 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Response to Arguments

9. Applicant's arguments, filed 4/10/07, with respect to the rejection(s) of claim(s) 7-12, 21, 23, 24, 51-62, 64, 71, 72, 85, 86, 89-93 under Grigsby et al. have been fully considered and are persuasive. Applicant's arguments, filed 4/10/07, with respect to the rejection(s) of claim(s) 13-17, 43, and 44 under Munoz et al. have been fully considered and are persuasive. Applicant's arguments, filed 4/10/07, with respect to the rejection(s) of claim(s) 25-31, 63, 73-81, 84, 87, and 94 under Grigsby et al. have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Bigg et al. Due to the new grounds of rejection this action is made non-final.

Conclusion


10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicole Coy whose telephone number is 571-272-5405. The examiner can normally be reached on M-F 7:30-5:00, 1st F off.

Art Unit: 3672

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bagnell can be reached on 571-272-6999. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

nac


William Heuder
Primary Examiner